Heat Surveillance Summary - 2000

Diane C. Rackers
Office of Epidemiology

During the summer of 2000, Missourians experienced a typical Missouri summer, until the end of August when Missouri experienced some unusually high heat indexes. While the number of heat-related deaths recorded for 2000 (n=23) was higher than usual, the number of heat-related illnesses reported in 2000 (n=842) was unusually high. (See Figures 1 and 2.) Part of the reason for the high number of heat-related illnesses can be attributed to increased reporting. We would like to assume the large number of heat-related illnesses were the result of high heat indexes, but with the media's help informing the public of the signs and symptoms of heat-related illness, cases were recognized early and treatment prevented a higher number of heat-related deaths.

The first peak of heat-related illnesses and deaths coincided with the first wave of high heat indexes, occurring July 6-16. (See Figure 3.) The Missouri Department of Health issued the first statewide Hot Weather Health Advisory on July 7, 2000. (See side-bar on page 2 for a description of the three advisory stages.) The heat index on July 6 had been 104 in St. Louis, 105 in Kansas City, 102 in Columbia, 100 in Springfield and 109 in Cape Girardeau. Heat indexes ranged between 90 to 111 across the state for the next ten days. This first peak of high heat indexes accounted for 26 percent (222/842) of the heat-related illnesses and 30 percent (7/23) of the heat-related deaths that occurred in 2000.

A smaller increase in heat-related illnesses and deaths occurred in mid-August and are attributed to 17 days of heat indexes of 100 or greater in the Kansas City area and in northwest Missouri, in addition to sporadic high heat indexes across the state.

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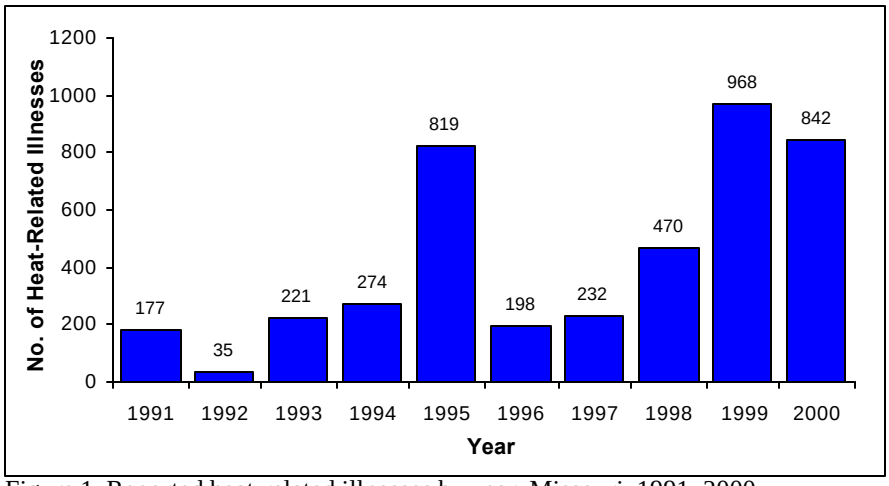

Figure 1. Reported heat-related illnesses by year, Missouri, 1991–2000.

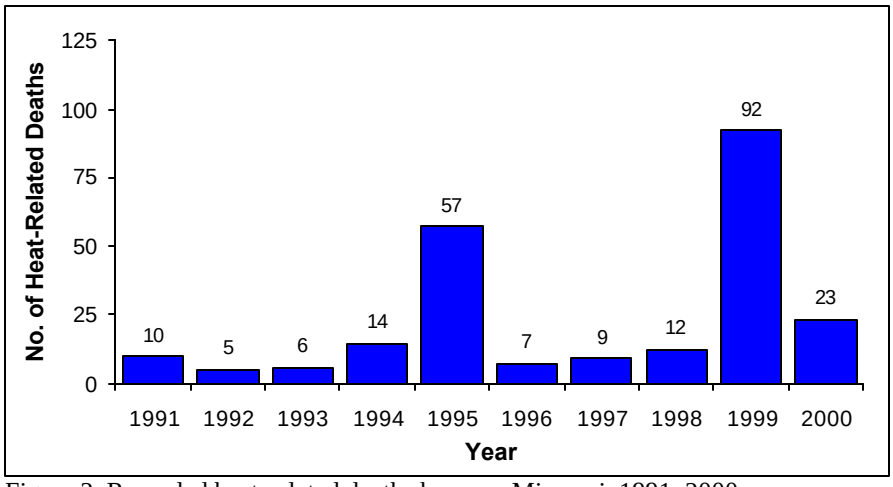

Figure 2. Recorded heat-related deaths by year, Missouri, 1991–2000.

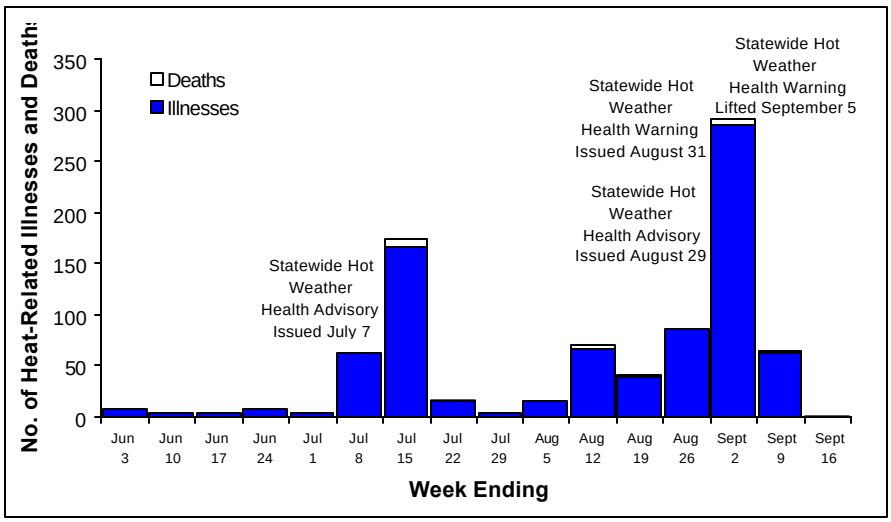

Figure 3. Reported heat-related illnesses and recorded heat-related deaths by week of occurrence, Missouri, Summer 2000.

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The highest peak of heat-related illnesses and deaths occurred August 28–September 4 when a second, more severe wave of high heat indexes occurred. The Missouri Department of Health issued a second statewide Hot Weather Health Advisory on August 29, 2000. The heat index on August 28 was 110 in St. Louis, 113 in Kansas City, 106 in Columbia, 100 in Springfield and 107 in Cape Girardeau. The advisory was upgraded to a statewide Hot Weather Health Warning on August 31. Missouri remained under a statewide Hot Weather Health Warning until September 5 when heat indexes across the state dropped considerably. Between August 28 and September 4, heat indexes ranged from 92 to 111 across the state. This eight day heat wave accounted for 41 percent (346/842) of the heat-related illnesses and 26 percent (6/23) of the heat-related deaths that occurred in 2000. Since the majority of schools in Missouri started their school year in mid to late August, school children and staff accounted for 41 percent (141/346) of the heat-related illnesses reported during this second heat wave.

During the summer of 1999, 968 heat-related illnesses and 92 heat-related deaths were reported; this was the highest number of heat-related illnesses and deaths in Missouri since the heat wave of 1980. A 13-day heat wave accounted for 68 percent (655/968) of the heat-related illnesses and 86 percent (79/92) of the heat-related deaths that occurred in 1999.

Of the 23 heat-related deaths in 2000, 13 (57%) were in individuals aged 65 or older. Of those 13 elderly deaths, 11 (85%) occurred inside residences: 7 (64%) had no air conditioning, 1 (9%) had a hotel style air conditioner, 1 (9%) had an air conditioner that was not working properly, and availability of air conditioning is unknown for 2 (18%) deaths. One elderly lady was found on an outside porch and an elderly man was found in a parked car. Of the 13 elderly deaths, 10 (77%) were noted to have health problems requiring medications that impaired their body's natural defenses to adjust to the heat. Of the 13 elderly deaths, 4 (31%) were from the St. Louis area and 8 (62%) were from the Kansas City area.

Elderly without air conditioning are usually found in their homes with fans blowing and frequently with the windows closed. Electric fans may be useful to increase comfort and to draw cool air into the home at night, but should not be relied on as the primary cooling device during a heat wave. When the temperature is in the upper 90s or higher, a fan will deliver overheated air to the skin at a rate that exceeds the capacity of the body to get rid of the heat, even with sweating; the net effect is to add heat rather than to cool the body. The better alternative when the temperature soars is to use an air conditioner, if one is available, or to seek shelter in an air-conditioned building.

Department of Health
Stages of Hot Weather Health Advisories

A statewide **Hot Weather Health Advisory** will be issued when heat indexes of 105° in a large proportion of the state are first reached (or predicted). The Department of Health will inform the public about the risks of heat-related illness and urge concern for those at high risk. Monitoring of temperatures and heat indexes will be intensified. An **Advisory** will not be canceled.

A statewide **Hot Weather Health Warning** will be issued when:

1. Heat indexes, measured at peak afternoon temperatures, have remained at 105° or more for two days in a large proportion of the state **and**
2. When weather predictions are for continued high-stress conditions for at least 24-48 hours in a large proportion of the state.

During a **Warning**, the Department of Health will encourage local health departments to assure that cooling shelters are available and also encourage other community agencies to provide relief from the heat stress. A **Warning** will be downgraded or canceled when heat indexes in a large proportion of the state fall below 105° for 48 hours and the forecast is for 48–72 hours of continued relief from heat stress.

The Department of Health will recommend to the Governor that a statewide **Hot Weather Health Emergency** be declared when:

1. Extensive areas of the state are experiencing high and sustained levels of heat stress (determined when the heat index reaches 105° for three days); **and**
2. Surveillance data demonstrate increased levels of heat-related illness and death statewide; **and**
3. The National Weather Service predicts that hot and humid conditions are likely to continue for several days in a large proportion of the state.

An **Emergency** will be canceled when the heat indexes in a large proportion of the state fall below 105° for 48 hours and the National Weather Service predictions indicate a low probability for the return of severe conditions for the following 48 to 72 hours.

Of the 23 heat-related deaths in 2000, 10 (43%) were in individuals under age 65. All of the 10 deaths occurred inside residences: 2 (20%) had no air conditioning, 2 (20%) had an air conditioner that was not working properly and availability of air conditioning is unknown for 6 (60%) deaths. Of the 10 non-elderly deaths, 4 (40%) were noted to have health problems requiring medications that impaired their body's natural defenses to adjust to the heat, and 2 (20%) were noted to be addicted to alcohol. One of the heat-related deaths recorded in 2000 occurred in February when a 17-month-old child was left in an overheated room at home. Of the 10 non-elderly deaths, 2 (20%) were from the St. Louis area and 1 (10%) was from the Kansas City area.

Individuals of all ages need to be aware that certain medications impair the body's response to heat. These medications include antipsychotics, major tranquilizers, antihistamines, over-the-counter sleeping pills, antidepressants, heart drugs and some antiparkinsonian agents. Physicians and pharmacists are urged to inform patients about medications that impair the body's response to heat.

Further information on prevention of heat-related illness and past surveillance data for Missouri is available through the Department of Health web site at **http://www.health.state.mo.us/ColdAndHeat/CAndH.html** or by calling the Office of Epidemiology at (573) 751-6128.